RPC - Video Capture
August 2, 2000

Summary
This note provides guidelines on capturing video into a computer for preview with the Ramp Preview Controller.

Introduction
To preview a ramp with the Ramp Preview Controller (RPC), video has to be captured into a computer. Since the RPC has no video capture features, you must use a third party program. This note provides information on the best settings for capturing video for preview in the Ramp Preview Controller. It explains how data rate and camera speed to be previewed interact, and gives some examples on how video can be captured into a Laptop.
We highly encourage you to either hire a video assist person who is experienced in this field, or to do extensive tests before capturing video on the set.

Data Rate and Minimum Preview Speed
The important issues when capturing video for previewing with the RPC are the data rate of the captured movie and the minimum speed you want to preview.
The data rate is the amount of data that is being moved from the hard disk to the screen every second. Data rate is measured in either Kilobytes per second (kB/s) or Megabytes per second (MB/s). The minimum preview speed is the slowest camera speed (fps) you can foresee using in your ramps. So if you know you will be ramping from 12 to 24 fps, 12 fps is the minimum preview speed.
During preview, the RPC varies the rate at which the data (the movie) is played back. To preview a slow preview speed, the RPC will play the movie data back faster. Since there is a limit on the data rate current computers can handle, the movie data rate and the minimum preview speed are two limiting factors. Here is the rule:

The slower the preview speed,
the lower the movies data rate has to be.

To provide a guideline, we ran some tests. We captured video from a DV camera with the Digital Origin “Edit DV” software and a Newer Technology “FireWire 2 Go” card on a PowerBook G3/233. We used the QuickTime Pro Player 4.1 to export the captured video to new movie files at different rates. Preview performance was checked on a Macintosh PowerBook G3/233 MHz and on a SONY VAIO PCG F390 (Pentium III, 500 MHz) Laptop. Data Rates were checked in Adobe Premiere. Interestingly, both Laptops came out about the same.
Your results may vary depending on the computer used, but please note that a faster computer may not necessarily provide better results. The hard disk’s data rate may be a limiting factor disregarding the speed of the computers chip. Here are the guidelines:

- If you want to preview down to 18 fps, keep the data rate below 1.5 MB/s.
- If you want to preview down to 6 fps, keep the data rate below 600 kB/s.
- If you want to preview down to 1 fps, keep the data rate below 200 kB/s.
- To achieve these data rates at acceptable image qualities, capture or save movies in 320 x 240 size.
- The best way to achieve a 200 kB/s data rate is to capture the movie first, and then to export it with the Sorensen codec, set to 320 x 240 size and “least” quality.
- For 2 step capturing (see below), use the Sorensen or Cinepak codec, but avoid the “best” settings.

- For 1 step capturing (see below), use the MPEG A codec, set to “least” quality. Avoid MPEG B.
- To improve the data rate of movies, don't include audio.
- Speed of Compression, from fastest to slowest: MJPEG A, Cinepak, Sorensen.
- Quality of Image at low data rates, best to worst: Sorensen , MPEG A, Cinepak.

One Versus Two Step Capture

Usually, capturing for preview is a two step process:

1. Capture the video. This usually results in a movie with a relatively high data rate; a DV movie, for instance, has a data rate of 3.5 MB/s.
2. Export the movie with a different codec at a lower data rate. We recommend saving at 320 x 240 size, with the Sorensen codec. Many programs, including the QuickTime Pro Player, have this feature.

When using the Irez CapSure card, it is possible to combine both steps into one. This card captures at 330 x 240, and the MPEG A codec can compress video in real time. This does not result in particularly good looking video, but it is faster than the two step process.

Capture Methods

There are basically three methods for capturing video into a computer:

1. Use the Irez CapSure PCMCIA card with a Laptop Computer
2. Use Digital Video (DV) and FireWire with a Laptop computer.
3. Use a capture card in a desktop computer. This is the easiest method, and probably will always yield the best image quality. If you have a desktop computer with a capture card you probably know how to use it, so we will not discuss this method any further in this note.

Method #1: CapSure Card

A PCMCIA card, called the Irez CapSure card, can digitize video into a Laptop at 320 x 240 image sizes. We have tested this card on Macintosh PowerBooks and found that it works well. We have not had a chance to test it on PC Laptops, as the Windows 98 drivers were still in alpha testing as of March 2000.

More information on the card can be found at:

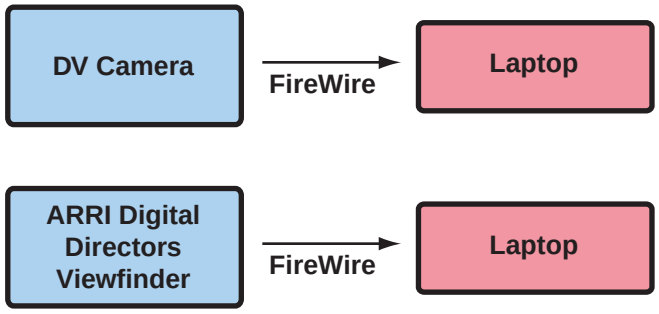
www.partec.com

Method #2: Digital Video (DV) and FireWire

Many Laptops now are equipped with a new interface, called FireWire (also known as iLink or IEEE 1394). What is special about FireWire is that it is fast enough to transport Digital Video (DV) in real-time. Many Laptops now come with a FireWire port built-in, and even older Laptops can be equipped with a FireWire PCMCIA card. For a list of FireWire devices, look at:

http://www.macintouch.com/firewire.html

If you have a FireWire equipped Laptop, you can transfer video from a DV camera, or from the ARRI Digital Directors Viewfinder, directly into your Laptop.



It is also possible to use the analog video from a video assist. The analog video signal must first be fed into a Video to DV FireWire converter box, and from there via FireWire to the Laptop.

We have experimented successfully with a SONY converter box (currently the DVMC-DA2 is being sold), but there are many other converters available. A listing of FireWire converter boxes can be found at:

http://www.macintouch.com/firewire.html

A report specifically on the SONY DVMC-DA1 converter can be found at:

http://www.macintouch.com/dvmc.html

The SONY DVMC-DA2 converter can be purchased at:

www.promax.com

DVMC-DA1 Front

DVMC-DA1 Rear

USB Video Capture

There are also various video capture devices available that connect to the computer via the USB port. Those cannot handle a fast enough frame rate, and we recommend against using them.

Compatibility Notes

When using a SONY VAIO Laptop, please be aware that you should not run the “DV Gate Motion” software at the same time you are running the Ramp Preview Controller.

Appendix A: What is a Codec?

Compression reduces the size of your media files and improves playback speed. Compression methods are referred to as "codecs" because they specify both a compression scheme and a decompression scheme.

QuickTime comes with a number of built-in video and audio compressors. You can install additional software for other compressors.

To learn more about multi media architectures and codecs, look at: www.terran.com/CodecCentral/index.html

To use compression in the QuickTime Pro Player program:

1. Choose Export from the File menu.
2. In the dialog box that appears, choose a movie or audio type from the Export menu.
3. Click Options.
4. If you don't see compression choices, click Settings.
5. Select a type of compression.

Appendix B: Capturing Video in Adobe Premiere

Here are notes on capturing with Adobe Premiere, using either method 1 or method 2.

1. Double Click on Premiere
2. Go to the File Menu and Choose Capture > Movie Capture. This will open up the movie capture window. Note that for the "Movie Capture" menu to be visible, this window must be in front.
3. From the "Movie Capture" menu choose "Recording Settings."
4. Uncheck the "Constrain" checkbox. Then. check the "Record At" radio button and enter the size for the video you will be capturing. For the Irez CapSure card, use 320 x 240. For FireWire DV input, use 720 x 480.
5. If you want to capture at a high quality and then have premiere compress the file using the compressor you choose in the Video Settings dialog, check the "Post Compress" checkbox. This is recommended. If you want to capture and compress in one step, choose the MPEGA compressors.
6. Set the Audio Block size to 1/2 seconds.
7. If you want Premiere to report dropped frames after the capture is complete, check the "Report Dropped Frames" checkbox.
8. Close the "Recording Settings" dialog by pressing "OK"
9. Choose "Video Input…" from the "Movie Capture" window to open the "Video Input" dialog.
10. In the top left, you will see a pop up menu (Mac) or drop down list (Windows.) Choose "Source". Set the "Digitizer" item to "DV Video" for FireWire DV input or to "Zoomed Video" for the Irez CapSure card. The Source for FireWire will only allow one choice. The Source for the CapSure card allows you to choose either "Composite" or "S-Video", which correspond to the two connectors on the CapSure card. (RCA Connector is composite, multi-pin connector is S-Video.) When all of the settings are complete, and if you are playing video into the FireWire or CapSure card, you should be able to see that video in the area on the right side of the dialog.
11. Now, in the top left menu/list, choose "Compression." To select the "Compressor", "Quality", and "Limit Data Rate to" items, refer to the Data Rate Guidelines above.
12. If desired, you can modify the image color, brightness, contrast, etc., by choosing "Image" from the menu/list at the top left of the dialog.
13. Press the OK button to close the "Video Input…" dialog.
14. Look at the "Sound Off" item in the "Movie Capture" menu. If it is not checked, then choose it so that it becomes checked. This turns off audio capture, allowing lower data rates.
15. You are now ready to capture. Start playing your video into the FireWire port or CapSure card. The video image should be visible in the Movie Capture window. Press the "Record" button to start capturing. When you are ready to stop, click the mouse button. If you are post-compressing the video, a dialog will come up to let you monitor the compressor's progress. When the clip is compressed and ready to go, it will open up in its own window in Premiere. Play the clip using the right triangle (play) button. If you are satisfied, save the clip by choosing "Save" from the file menu or by pressing Cmd-S (Mac) or Ctrl-S (Windows).
16. You can capturing another clip by clicking on the capture window to bring it to the front and repeating step 15.

For more information on this issue, please contact your local ARRI representative.